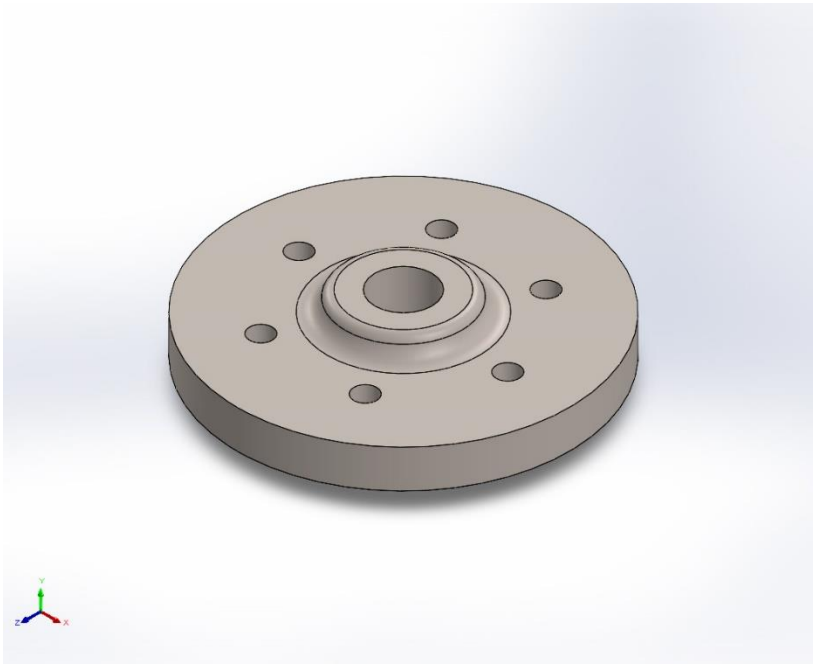


Simulation of Disc A

Date: November 12, 2021
Designer: Solidworks
Study name: Static 2
Analysis type: Static

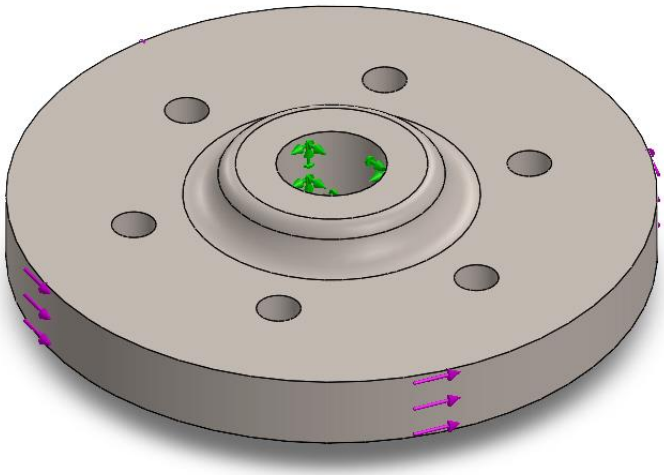
Table of Contents

Description

No Data

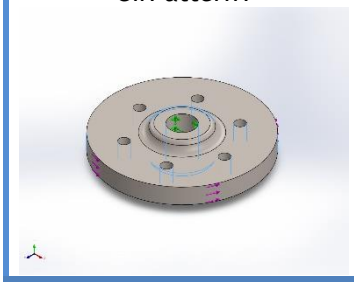
Assumptions

Model Information



Model name: Lab 5 Disc A
Current Configuration: Default

Solid Bodies

Document Name and Reference	Treated As	Volumetric Properties	Document Path/Date Modified
CirPattern1 	Solid Body	**Mass:3.87589 kg** **Volume:0.000503363 m^3** **Density:7,700 kg/m^3** **Weight:37.9837 N**	**C:\Users\harsh\Desktop\100792045_MECE2310U_Labs\100792045_Lab5\Lab 5 Disc A.SLDPRT** Nov 12 05:45:30 2021

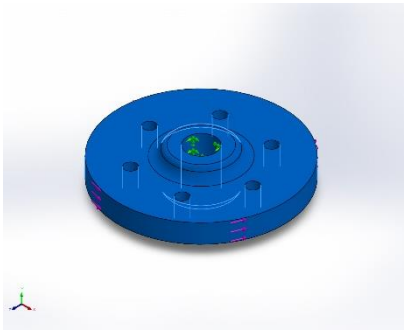
Study Properties

Study name	Static 2
Analysis type	Static
Mesh type	Solid Mesh
Thermal Effect:	On
Thermal option	Include temperature loads
Zero strain temperature	298 Kelvin
Include fluid pressure effects from SOLIDWORKS Flow Simulation	Off
Solver type	Automatic
Inplane Effect:	Off
Soft Spring:	Off
Inertial Relief:	Off
Incompatible bonding options	Automatic
Large displacement	Off
Compute free body forces	On
Friction	Off
Use Adaptive Method:	Off
Result folder	SOLIDWORKS document (C:\Users\harsh\Desktop\100792045_MECE2310U_Labs\100792045_Lab5)

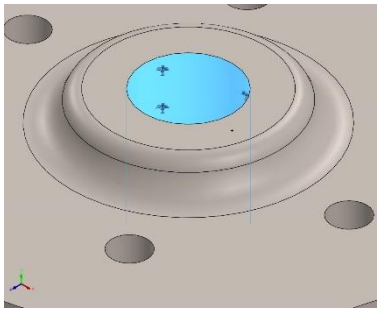
Units

Unit system:	SI (MKS)
Length/Displacement	mm
Temperature	Kelvin
Angular velocity	Rad/sec
Pressure/Stress	N/m^2

Material Properties

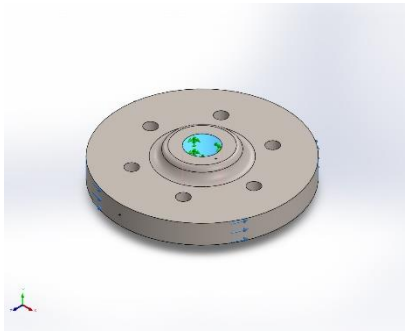
Model Reference	Properties		Components
	**Name:**	Alloy Steel	SolidBody 1(CirPattern1)(Lab 5 Disc A)
	Model type:	Linear Elastic Isotropic	
	Default failure criterion:	Max von Mises Stress	
	Yield strength:	6.20422e+08 N/m^2	
	Tensile strength:	7.23826e+08 N/m^2	
	Elastic modulus:	2.1e+11 N/m^2	
	Poisson's ratio:	0.28	
	Mass density:	7,700 kg/m^3	
	Shear modulus:	7.9e+10 N/m^2	
	Thermal expansion coefficient:	1.3e-05 /Kelvin	
Curve Data:N/A			

Loads and Fixtures

Fixture name	Fixture Image	Fixture Details
Fixed-1		**Entities:** 1 face(s) **Type:** Fixed Geometry

Resultant Forces

Components	X	Y	Z	Resultant
Reaction force(N)	-0.0724888	0.0649569	0.0525753	0.110626
Reaction Moment(N.m)	0	0	0	0

Load name	Load Image	Load Details
Torque-1		**Entities:** 1 face(s) **Reference:** Face< 1 > **Type:** Apply torque **Value:** 200 N.m

Connector Definitions

No Data

Contact Information
No Data

Mesh information

Mesh type	Solid Mesh
Mesher Used:	Standard mesh
Automatic Transition:	On
Include Mesh Auto Loops:	Off
Jacobian points for High quality mesh	16 Points
Element Size	5 mm
Tolerance	0.25 mm
Mesh Quality	High

Mesh information - Details

Total Nodes	53797
Total Elements	35396
Maximum Aspect Ratio	5.6649
% of elements with Aspect Ratio < 3	99.2
Percentage of elements with Aspect Ratio > 10	0
Percentage of distorted elements	0
Time to complete mesh(hh;mm;ss):	00:00:02
Computer name:	

Sensor Details
No Data

Resultant Forces

Reaction forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	-0.0724888	0.0649569	0.0525753	0.110626

Reaction Moments

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N.m	0	0	0	0

Free body forces

Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N	-0.014344	0.0973229	0.0771695	0.125031

Free body moments

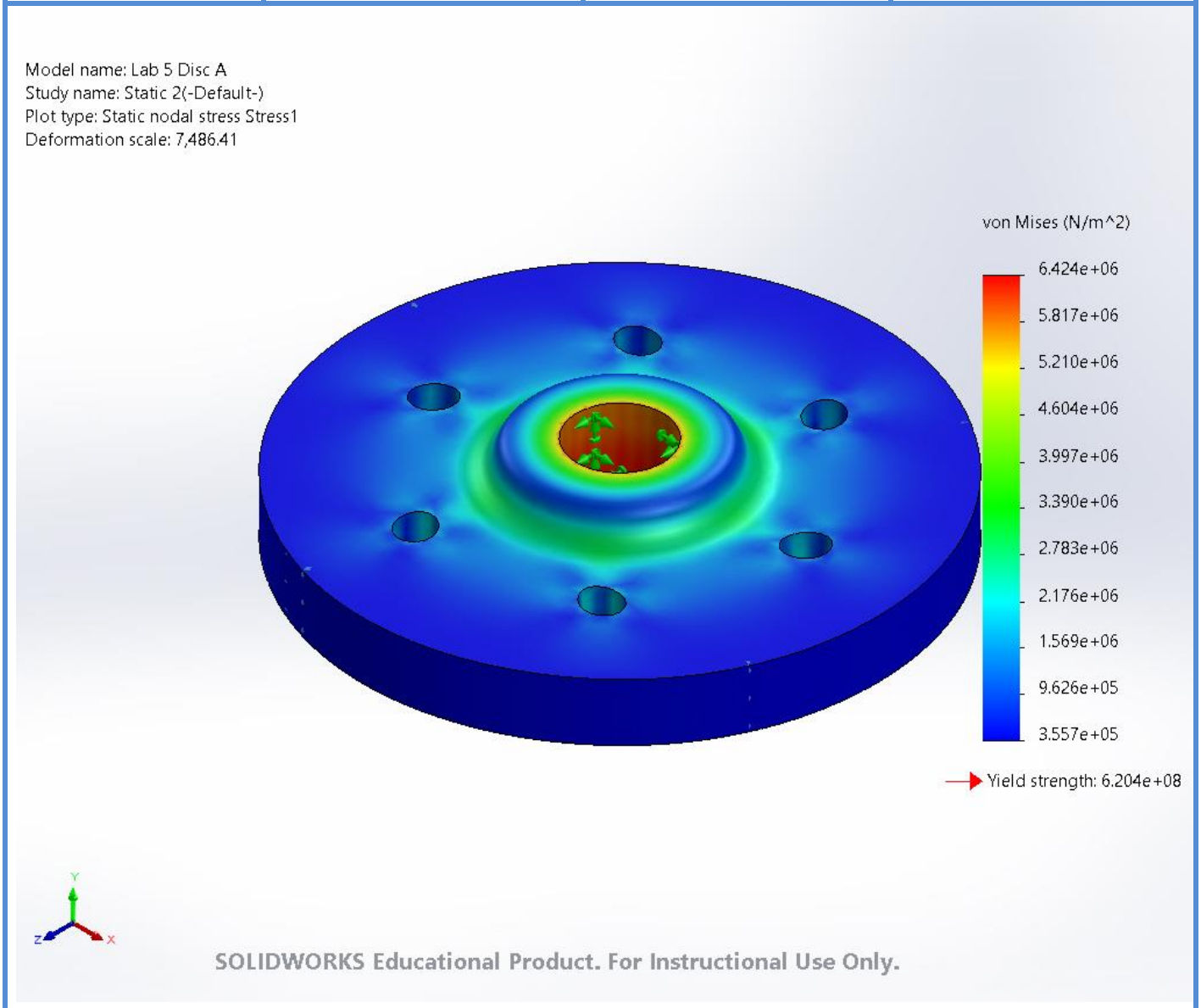
Selection set	Units	Sum X	Sum Y	Sum Z	Resultant
Entire Model	N.m	0	0	0	1e-33

Beams

No Data

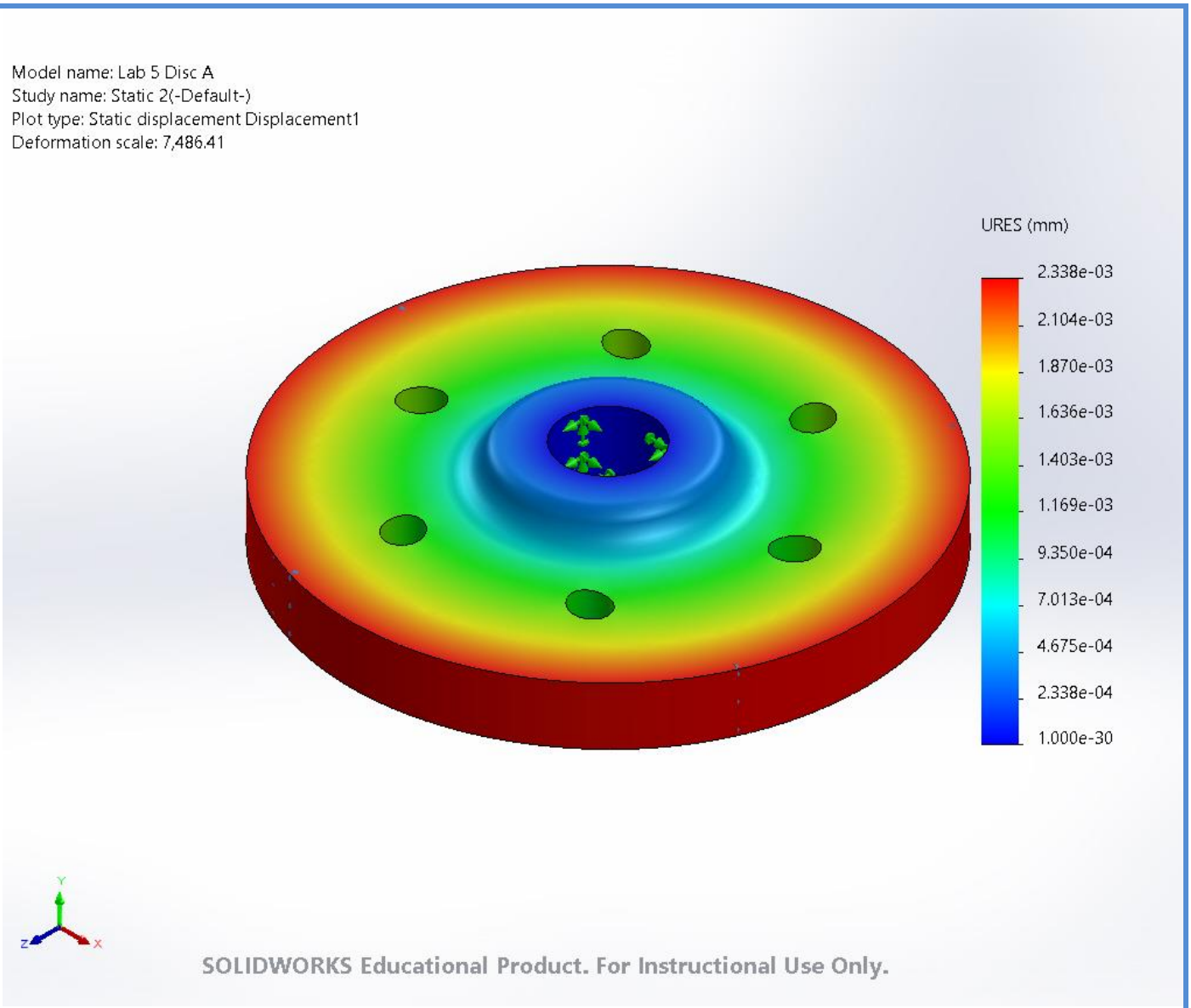
Study Results

Name	Type	Min	Max
Stress1	VON: von Mises Stress	3.557e+05N/m^2 Node: 930	6.424e+06N/m^2 Node: 51464



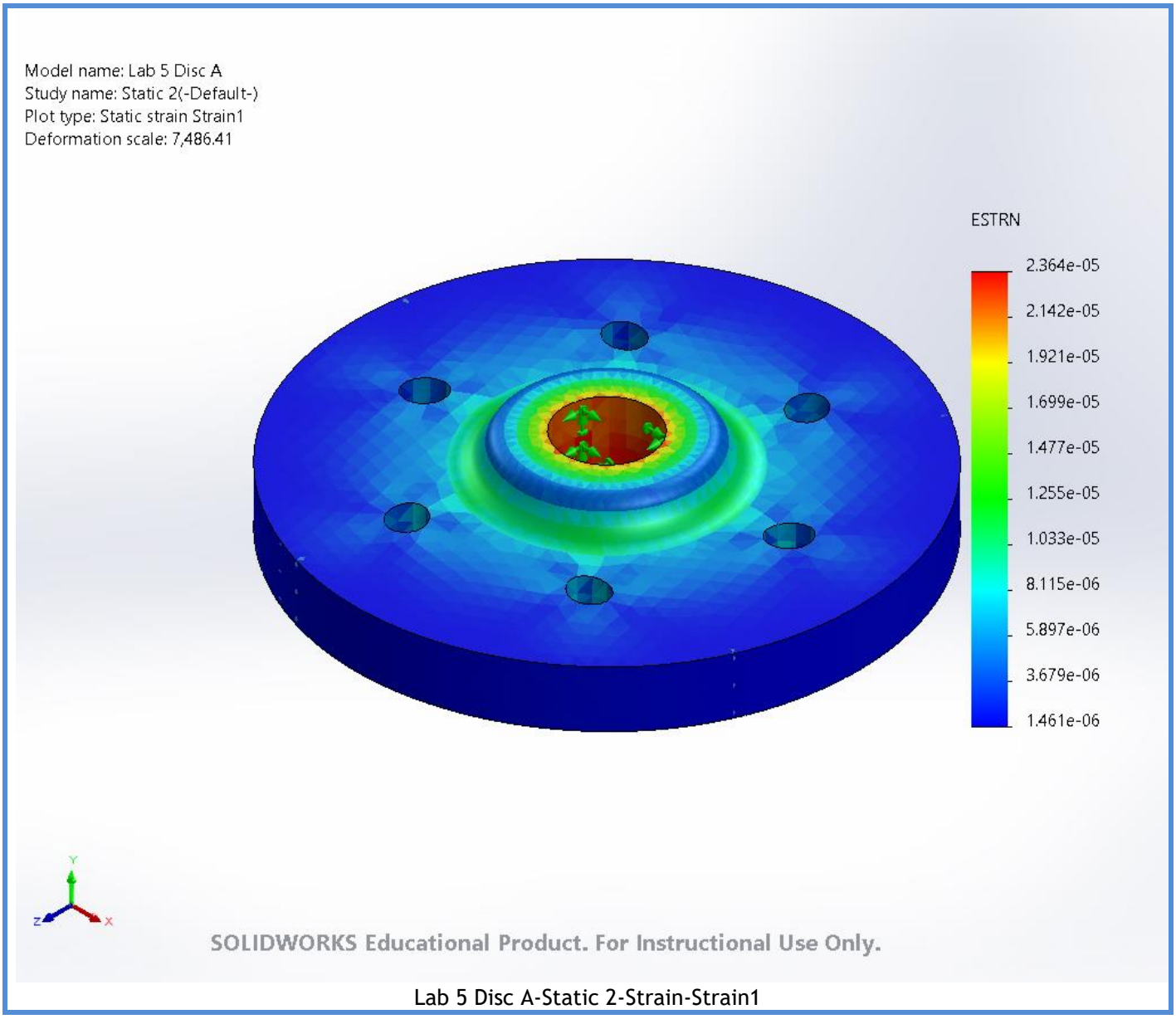
Lab 5 Disc A-Static 2-Stress-Stress1

Name	Type	Min	Max
Displacement1	URES: Resultant Displacement	0.000e+00mm Node: 211	2.338e-03mm Node: 46705



Lab 5 Disc A-Static 2-Displacement-Displacement1

Name	Type	Min	Max
Strain1	ESTRN: Equivalent Strain	1.461e-06 Element: 10256	2.364e-05 Element: 5553



Lab 5 Disc A-Static 2-Strain-Strain1

Conclusion